

CLAIMS

1. A cutting tool insert particularly useful for turning of cast irons and low alloyed steels comprising a cemented carbide body and a coating, said body having a composition of from about 3.0 to 8.0 wt.% Co, from about 0.5 to 4.0 wt.% of cubic carbonitride forming elements from groups IVb and Vb of the periodic table, N, C, and WC, and a from about 5 to 40 μm thick surface zone which is binder phase enriched and nearly free of cubic carbonitride phase, with a maximum binder phase content in the surface zone of from about 1.2 to 3 by volume of the bulk binder phase content, said coating comprising:

- a first, innermost layer of $\text{TiC}_x\text{N}_y\text{O}_z$ with $0.7 \leq x+y+z \leq 1$, with equiaxed grains and a total thickness $<2 \mu\text{m}$;
- a layer of $\text{TiC}_x\text{N}_y\text{O}_z$ with $0.7 \leq x+y+z \leq 1$, with a thickness of from about 3 to 14 μm , with columnar grains; and
- at least one layer of Al_2O_3 with a thickness of from about 2 to 14 μm .

2. The cutting tool insert of claim 1 wherein said body has a composition of from about 4.5 to 7.0 wt.% Co, from about 1.0 to 4.0 wt.% of cubic carbonitride forming elements from groups IVb and Vb of the periodic table and wherein said coating further comprises:

- said first, innermost layer of $\text{TiC}_x\text{N}_y\text{O}_z$ with $z < 0.5$ with equiaxed grains and a total thickness $>0.1 \mu\text{m}$;
- said layer of $\text{TiC}_x\text{N}_y\text{O}_z$ with $z < 0.2$, $x > 0.3$ and $y > 0.2$ with a thickness of from about 4 to 12 μm with columnar grains; and
- said least one layer of Al_2O_3 has a thickness of from about 3 to 10 μm .

3. The cutting tool insert of claim 2 wherein said coating comprises:

- said first, innermost layer of $\text{TiC}_x\text{N}_y\text{O}_z$ with $y > x$ and $z < 0.2$ with equiaxed grains and a total thickness $> 0.1 \mu\text{m}$; and
- said layer of $\text{TiC}_x\text{N}_y\text{O}_z$ with $x > 0.4$ with a thickness of from about 5 to 10 μm with columnar grains.

4. The cutting tool insert of claim 3 said coating further comprising said first, innermost layer of $\text{TiC}_x\text{N}_y\text{O}_z$ with $y > 0.7$.

5. The cutting tool insert of claim 1 further comprising an outer layer of $\text{TiC}_x\text{N}_y\text{O}_z$, $\text{HfC}_x\text{N}_y\text{O}_z$ or $\text{ZrC}_x\text{N}_y\text{O}_z$ or mixtures thereof with $0.7 \leq x+y+z \leq 1.2$ with a thickness $< 3 \mu\text{m}$.

6. The cutting tool insert of claim 5 wherein said outer layer comprises $\text{TiC}_x\text{N}_y\text{O}_z$, $\text{HfC}_x\text{N}_y\text{O}_z$ or $\text{ZrC}_x\text{N}_y\text{O}_z$ or mixtures thereof with $y > x$ and $z < 0.4$ with a thickness from about 0.4 to 1.5 μm .

7. The cutting tool insert of claim 6 wherein said outer layer comprises $\text{TiC}_x\text{N}_y\text{O}_z$, $\text{HfC}_x\text{N}_y\text{O}_z$ or $\text{ZrC}_x\text{N}_y\text{O}_z$ or mixtures thereof with $y > 0.4$.

8. The cutting tool insert of claim 7 wherein said outer layer comprises $\text{TiC}_x\text{N}_y\text{O}_z$, $\text{HfC}_x\text{N}_y\text{O}_z$ or $\text{ZrC}_x\text{N}_y\text{O}_z$ or mixtures thereof with $y > 0.7$.

9. The coated cutting tool insert of claim 1 wherein the S-value of the cemented carbide body is within the range from about 0.78 to 0.94 and the mean intercept length of the WC phase is from about 0.35 to 0.85 μm .

10. The coated cutting tool insert of claim 9 wherein the S-value of the cemented carbide body is within the range from about 0.81 to 0.92 and the mean intercept length of the WC phase is from about 0.45 to 0.75 μm .

11. The coated cutting tool insert of claim 1 wherein N is present in the sintered body in an amount corresponding to >1.0 % of the weight of the elements from groups IVb and Vb of the periodic table.

12. The coated cutting tool insert of claim 11 wherein N is present in the sintered body in an amount corresponding from about 1.7 to 5.0 % of the weight of the elements from groups IVb and Vb of the periodic table.

13. The coated cutting tool insert of claim 1 wherein the amount of cubic carbonitrides corresponds to from about 0.5 to 4.0% by weight of the cubic carbonitride forming elements titanium, tantalum and niobium.

14. The coated cutting tool insert of claim 13 wherein the amount of cubic carbonitrides corresponds to from about 1.0 to 4.0% by weight of the cubic carbonitride forming elements titanium, tantalum and niobium.

15. The coated cutting tool insert of claim 13 wherein that the ratio between tantalum and niobium is within from about 0.8 to 4.5 by weight and the ratio between titanium and niobium is within from about 0.5 to 7.0 by weight.

16. The coated cutting tool insert of claim 15 wherein that the ratio between tantalum and niobium is within from about 1.2 to 3.0 by weight and the ratio between titanium and niobium is within from about 1.0 to 4.0 by weight.

17. Use of a cutting tool insert according to claim 1 for turning in cast irons and low alloyed steels at cutting speeds of 100-700 m/min with feed values of from about 0.04 to 0.80 mm/rev.